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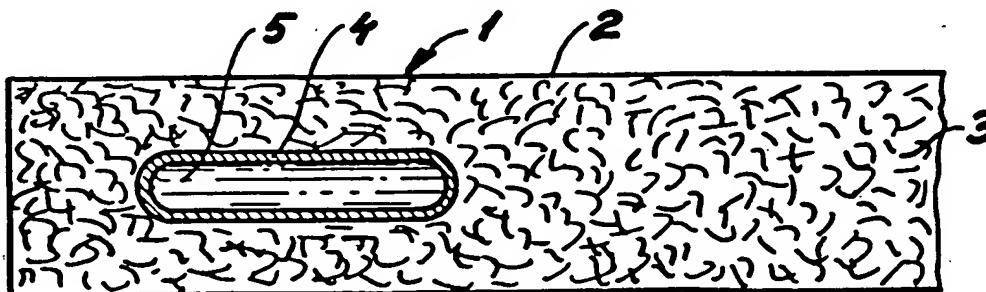
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 INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/DK86/00013 <b>(22) International Filing Date:</b> 4 February 1986 (04.02.86) <b>(31) Priority Application Number:</b> 499/85 <b>(32) Priority Date:</b> 5 February 1985 (05.02.85) <b>(33) Priority Country:</b> DK  <b>(71)(72) Applicant and Inventor:</b> JENSEN, Kaj, Berg [DK/DK]; Skovbrynet 24, DK-4700 Næstved (DK). <b>(74) Agent:</b> HOFMAN-BANG & BOUTARD A/S; Adelgade 15, DK-1304 Copenhagen K (DK).  <b>(81) Designated States:</b> AT (European patent), AU, BE (European patent), BG, BR, CF (OAPI patent), CG (OAPI patent), CH (European patent), CM (OAPI patent), DE (European patent), DK, FI, FR (European patent), GA (OAPI patent), GB (European patent), HU, IT (European patent),		JP, KP, KR, LK, LU (European patent), MC, MG, ML (OAPI patent), MR (OAPI patent), MW, NL (European patent), NO, RO, SD, SE (European patent), SN (OAPI patent), SU, TD (OAPI patent), TG (OAPI patent), US.  <b>Published</b> <i>With international search report.</i>

**(54) Title:** SELF-EXTINGUISHING CIGARETTE


OCT 15 1986

**(57) Abstract:**

A self-extinguishing cigarette comprising a tubular outer wrapper surrounding a tobacco rod or column is provided with a non-collapsible elongated ampoule, which will break, soften, fuse or burn when exposed to heat, containing a non-inflammable liquid medium in a sufficient amount to extinguish the glow in the cigarette when liberated from the ampoule and arranged coaxially at the mouth end and within the body of the cigarette.

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## Self-extinguishing cigarette

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The invention relates to a self-extinguishing cigarette.

It is well-known that a discarded smouldering cigarette can be unpleasant and dangerous because the cigarette may continue to smoulder and burn after the smoking has been discontinued.

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The unpleasant aspects consist primarily in bad smell and odour produced during the slow burning of the discarded cigarette. The dangerous aspects consist in different types of serious fire hazards. Smouldering cigarettes in ashtrays have caused numerous fires which have resulted in complete destruction of buildings, ships, etc., e.g. when ashtrays with still smouldering cigarettes have been emptied in containers containing inflammable materials; and smouldering cigarettes discarded on the ground have caused numerous large and devastating fires in forests and fields.

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These inconveniences and hazards could be eliminated or at least minimized if it was possible to provide a reliable self-extinguishing cigarette, which in the present context is defined as a cigarette having the ability of extinguishing itself at the moment when the glow arrives at a predetermined position on its way towards the mouth end of the cigarette. A further advantage of a self-extinguishing cigarette consists in the possibility of arranging the extinguishing position at such a point that it is impossible to smoke the last part of the cigarette, which is acknowledged as being the most dangerous, seen from a medical point of view.

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In GB patent specification no. 245,329 it has been pro-

posed to provide a self-extinguishing cigarette comprising an encircling band or bands located intermediate its ends and treated chemically or by constriction, or both, for the purpose of extinguishing the slow burning or smouldering of the cigarette when the smoking thereof is discontinued, whilst permitting the proper burning of the cigarette when smoked in the usual way.

However, this solution cannot be considered satisfactory, partly because of unreliability, partly because the chemically treated bands will cause formation of unacceptable gases with bad or strange taste when exposed to the glow during or after smoking.

Cigarette filters containing a single or a plurality of collapsible capsule(s) or ampoule(s) filled with water or other liquids are known, e.g. from US patent specification no. 3,428,049 and DK patent specification no. 125,566. The water or liquid contained in these capsules or ampoules is released by applying a squeezing pressure to the outer wrapper of the filter, thereby breaking the collapsible capsule or ampoule. According to this part of the known art, the purpose of releasing the water or the liquid in the filter is to improve the effect of the filter and if desired to augment or supplement the flavour of the smoke.

The safe functioning of such filters is however endangered by untimely breaking of the collapsible capsules or ampoules, e.g. during the production of the filter; when the filters are arranged in the cigarettes; and during packaging and transport of the cigarettes from factory to user.

The object of the present invention is to provide a reliable self-extinguishing cigarette, as defined above.

which does not exhibit any of the above mentioned drawbacks.

5 This is achieved according to the present invention  
by a self-extinguishing cigarette comprising a tubular  
outer wrapper surrounding a tobacco rod or column, which  
is characterized by comprising a non-collapsible elongated  
ampoule, which will break, soften, fuse or burn when  
10 exposed to heat, containing a non-inflammable liquid  
medium in a sufficient amount to extinguish the glow  
in the cigarette when liberated from the ampoule and  
arranged coaxially at the mouth end and within the body  
of the cigarette.

15 During smoking of the cigarette according to the present  
invention the glow will move down towards the ampoule,  
which will break, either directly by the action of the  
heat of the glow or indirectly by a pressure increase  
in the liquid medium, thus causing release of the liquid  
20 medium, preferably water or an aqueous solution, contained  
in the ampoule. The released water or liquid will then  
rapidly extinguish the glow, i.e. the cigarette, without  
any conscious action from the smoker being needed.

25 Since the non-collapsible construction of the ampoule  
ensures that it will not break when the cigarette is  
subjected to a normal squeezing pressure, i.e. a pressure  
less than what would destroy the cigarette in any case,  
there is no risk of untimely release of the water or  
30 liquid contained in the ampoule.

The ampoule is preferentially formed from a material,  
which will fuse or soften by the action of heat from  
the glow, and which does not produce noxious gases or  
35 any smell or taste when exposed to heat. Polyethylene  
and polypropylene are examples of such preferred materials.

Preferably the ampoule has a length of about 10-25 mm, an external diameter of about 1.5 - 4 mm and an internal diameter of about 0.5 - 3.5 mm. Such ampoules can easily be manufactured by spot sealing a corresponding tube  
5 filled with water or liquid.

If desired, the water or the liquid may be kept at a moderate pressure within the ampoule.

10 The water or the liquid contained in the ampoule may contain additives, such as surfactants or other useful components, e.g. components augmenting or supplementing the flavour of the smoke, such as menthol or lemon oil.

15 Regardless of the composition and nature of the liquid in the ampoule, it should be present in a sufficient amount to extinguish the glow in the cigarette. In case of water less than 0.03 ml will generally suffice.

20 According to a preferred embodiment of the invention the ampoule is formed with a first end wall facing the glow and an opposite second end wall facing the mouth end of the cigarette, said first end wall being thinner than said second end wall.

25 The cigarette according to the present invention may also be provided with a filter element facing the tobacco rod or column. In this case the ampoule may be embedded partly in the filter element, partly in the tobacco  
30 rod, or it may be entirely embedded in the tobacco rod.

In the drawings

fig. 1 is a longitudinal cross-sectional view of one  
35 embodiment of the cigarette according to the invention, without filter tip;

fig. 2 is a longitudinal cross-sectional view of another embodiment of the cigarette according to the invention, with filter tip; and

- 5 fig. 3 is a longitudinal cross-sectional view of a filter element containing an ampoule.

As shown in fig. 1 a cigarette 1 without filter comprises an outer wrapper 2 surrounding a tobacco rod or column  
10 3 containing an ampoule 4 containing water 5 arranged at the mouth end of the cigarette.

The filter cigarette 1 shown in fig. 2 comprises an outer wrapper 2 surrounding a tobacco rod or column  
15 3 facing a filter rod 6. In this case the ampoule 4 is embedded partly in the filter rod 6, partly in the tobacco rod 3.

If it is desired to provide a filter cigarette, which  
20 will extinguish when the glow is further away from the filter, the ampoule may be embedded totally in the tobacco rod.

Fig. 3 shows a filter element 7 which may be used in  
25 the manufacture of the cigarette shown in fig. 2. This filter element 7 comprises a filter rod 6 and an ampoule 4 partially embedded therein. The illustrated ampoule 4 is formed with a thin end wall 8 facing the glow and an opposite end wall 9 having normal thickness and facing  
30 the mouth end of the filter.



P A T E N T   C L A I M S

1. A self-extinguishing cigarette comprising a tubular  
outer wrapper surrounding a tobacco rod or column,  
5 c h a r a c t e r i z e d by comprising a non-collapsible  
elongated ampoule, which will break, soften, fuse or  
burn when exposed to heat, containing a non-inflammable  
liquid medium in a sufficient amount to extinguish the  
glow in the cigarette when liberated from the ampoule  
10 and arranged coaxially at the mouth end and within the  
body of the cigarette.

2. A self-extinguishing cigarette according to claim  
1,  
15 c h a r a c t e r i z e d in that the liquid medium  
is water or an aqueous solution.

3. A self-extinguishing cigarette according to claims  
1 - 2,  
20 c h a r a c t e r i z e d in that the ampoule is shaped  
with a first end wall facing the glow and an opposite  
second end wall facing the mouth end of the cigarette,  
said first end wall being thinner than said second end  
wall.

25 4. A self-extinguishing cigarette according to claims  
1 - 3,  
c h a r a c t e r i z e d in that the ampoule has a  
length of about 10 - 25 mm, an external diameter of  
30 about 1.5 - 4 mm, and an internal diameter of about  
0.5 - 3.5 mm.

5. A self-extinguishing cigarette according to claims  
1 - 4,  
35 c h a r a c t e r i z e d in that the ampoule is formed  
of a plastic material which will soften, fuse or burn

when exposed to heat without liberating noxious or smelling gases.

6. A self-extinguishing cigarette according to claim 5,  
5 c h a r a c t e r i z e d in that said plastic material  
is polyethylene or polypropylene.

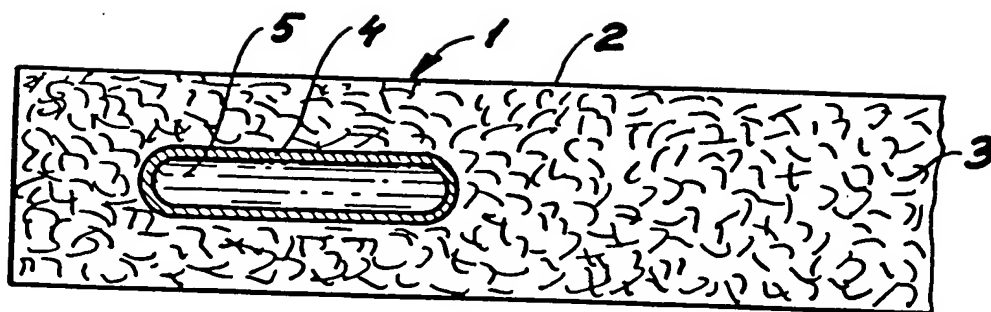
7. A self-extinguishing cigarette according to claims  
1 - 6,  
10 c h a r a c t e r i z e d in that said cigarette is  
provided with a filter element facing the tobacco rod  
or column and that the ampoule is embedded partly in  
the filter element, partly in the tobacco rod.

15 8. A self-extinguishing cigarette according to claims  
1 - 6,  
c h a r a c t e r i z e d in that said cigarette is  
provided with a filter element facing the tobacco rod  
or column and that the ampoule is entirely embedded  
20 in the tobacco rod.

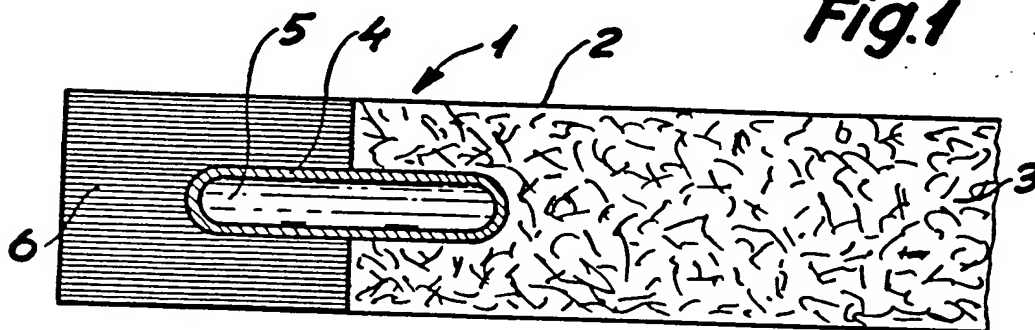
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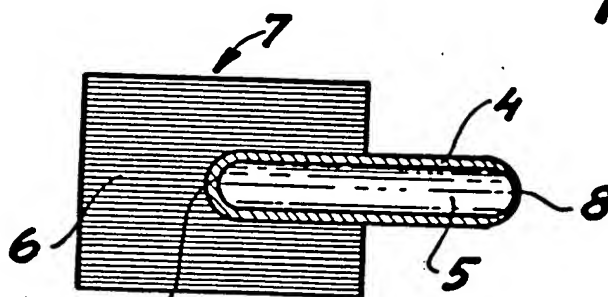
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**Fig. 1**



**Fig. 2**



**Fig. 3**

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/DK86/00013

## I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) <sup>6</sup>

According to International Patent Classification (IPC) or to both National Classification and IPC <sup>4</sup>

A 24 D 1/10

## II. FIELDS SEARCHED

Minimum Documentation Searched <sup>7</sup>

Classification System

Classification Symbols

IPC 2	A 24 C 5/50
IPC 4	A 24 D 1/00, /06, /10
US C1	131:4, 349, 360-363

Documentation Searched other than Minimum Documentation  
to the Extent that such Documents are Included in the Fields Searched <sup>8</sup>

SE, NO, DK, FI classes as above

## III. DOCUMENTS CONSIDERED TO BE RELEVANT <sup>9</sup>

Category <sup>10</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
X, Y	US, A, 3 985 143 (JAMES B LAPPIN JR) 12 October 1976	1-8
X	US, A, 1 726 737 (E M HARRIS) 30 December 1927	1-8
Y	US, A, 4 436 101 (WILLIAM SEATTS) 13 March 1984	1-8
Y	US, A, 4 226 249 (MARION A NEWMAN) 7 October 1980	1-8
Y	DK, B, 125 566 (THE H-2-0 FILTER CORPO- RATION, NEW YORK, USA) 12 March 1973	1-8
Y	DK, B, 115 903 (THE H-2-0 FILTER CORPO- RATION, NEW YORK, USA) 17 November 1969	1-8

<sup>10</sup> Special categories of cited documents: <sup>14</sup>

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## IV. CERTIFICATION

Date of the Actual Completion of the International Search

Date of Mailing of this International Search Report

1986-04-21

1986-05-13

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Signature of Authorized Officer

Swedish Patent Office

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